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EXAMINER	
WANG, EUGENIA	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/555,447	FUJINO ET AL.	
	Examiner	Art Unit	
	EUGENIA WANG	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received February 4, 2010:

a. Claim 2 has been canceled as per Applicant's request. Claims 1, 4, 6, and 8 are pending.

b. The res judicata rejection has been withdrawn in light of the amendment. (It is noted, such a rejection may be applicable again upon removal of the new matter, as set forth below.)

c. The core of the previous prior art rejection of record has been maintained, with slight changes made in light of the amendments. All changes made are made in light of the amendment. Thus the action is final.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 4, 6, and are 8 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 now recites a total thickness of the

separator (porous film and non-woven fabric) being between 18 and 30 μm, inclusive. However such a range is not appreciated within the original disclosure. For example, para 0044 states that the sum of the thicknesses of the non-woven fabric used as the separator and the thickness of the porous film is desirably about 15 to 30 μm. Furthermore, none of the examples (as indicated by table 1 on p 32) appreciates a total thickness of 18 μm. Accordingly, such newly added claim language (with respect to the total thickness) is seen to be new matter, neither the range or a specific endpoint is appreciated in the disclosure as originally filed. Since claims 4, 6, and 8 are dependent upon claim 1, they are rejected for the same reason.

3. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation of having a porous film with a thickness of 3 to 10 μm, inclusive, and a

non-woven fabric having a thickness of 15 to 25 μm, which yields a total thickness having a lower limit of 18 μm and an upper limit of 35 μm, and the claim also recites the fact that the total thickness has a lower limit of 18 μm and an upper limit of 30 μm which is the narrower statement of the range/limitation. Since claims 4, 6, and 8 are dependent upon claim 1, they are rejected for the same reason

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 2, 4, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6287720 (Yamashita et al.) in view of US 6,576,366 (Fujiwara et al.), and US 2005/0014064 (Shi et al.).

As to claim 1, Yamashita et al. teach a nonaqueous secondary battery with a nonaqueous electrolyte with a positive electrode comprising cathode active material, a negative electrode comprising anode active material, and a separator disposed between the positive and negative electrodes, operatively with the electrolyte (col. 5, lines 8-23). Furthermore, Yamashita et al. exemplify a lithium ion secondary battery with a cathode active material made of a composite of a lithium oxide (col. 11, lines 7-10). An anode active material inherently has the property of absorbing and desorbing lithium. Example 6 has a separator [13B] made of polyethylene (col. 30, lines 63-66). Additionally, example 6 has a second layer of the separator that acts as a porous film [13A] made of insulating substance (filler) α-Al_2O_3 and binder polyvinylidene fluoride (PVDF), where the porous film [13A] is directly formed on the cathode active material layer [11b] (col.

29, lines 51-58; col. 30, lines 5-8). Furthermore, the weight ratio of α-Al_2O_3 to PVDF is 100/5 (col. 29, lines 63-64). Therefore, the weight percentage is:

$$\frac{wt\_alu\min a}{total\_wt} = \frac{100}{100+5} * 100\% = 95.2\%$$

Yamashita et al. does not teach that (a) the separator comprises a non-woven fabric, (b) that the non-woven fabric has a melt-down temperature of 150°C or more, or (c) the thicknesses of each individual section of the separator: 3 μm to 10 μm [13A] for the porous film layer and 15 μm to 25 μm for the non-woven fabric [13B], wherein the total thickness is 18 μm to 30 μm.

With respect to (a), Fujiwara et al. teaches a non-aqueous electrolyte secondary cell (title). In the teaching, materials of separators are disclosed including olefin polymers, such as polyethylene (as used by Yamashita et al. in example 6), and non-woven cloth (col. 9, lines 27-38). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the non-woven cloth taught by Fujiwara et al. for the separator of Yamashita et al.'s battery, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

With respect to (b), Shi et al. teaches a high melt integrity battery separator for lithium ion batteries (title). The separators are made of nonwoven flat sheets, wherein high temperature melt integrity means that the separator will sustain dimensional stability until a temperature of at least 200°C (abstract; para 0011). The motivation for

providing nonwoven flat sheet separators with this characteristic is in order to better maintain dimensional stability within a battery. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use the materials of Shi et al. (nonwoven flat sheets) in order to improve dimensional stability of the separator at higher temperatures.

With respect to (c), it is first noted that Yamashita et al. teaches a separator [13A, 13B] with a thickness between 100 nm to 100 μm (col. 7, lines 52-55). Specifically, the composite separator thickness of example 6 (relied upon) is 25 μm (and thus lies in the claimed range of the total thickness) (col. 31, lines 10-13). Although Yamashita et al. does not mention the thicknesses of each individual section of the separator, 15 μm to 25 μm for the non-woven fabric [13B] and 3 μm to 10 μm [13A] for the porous film layer, fig. 5 show a proportion of the layers (i.e. substantially equal), which at the very least would render obvious the proportion shown. As applied to example 6, wherein the total thickness is 25 μm, each layer being 12.5 μm would be obvious (in light of the proportions shown in fig. 5), wherein 12.5 μm is seen to be close to the upper limit of the porous film thickness (10 μm as claimed) as well as the lower limit of the non-woven fabric thickness (15 μm as claimed). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Additionally, claims that differ from the prior art only by slightly different (non-overlapping) ranges are prima facie obvious without a showing that the

claimed range achieves unexpected results relative to the prior art. (In re Woodruff, 16 USPQ2d 1935,1937 (Fed. Cir. 1990)).

As to claim 4, the combination teaches the claim limitation, as Shi et al. teaches nonwoven flat sheets, which are fibers that are held together, used for separators; specific fibers are polyamides and polyimides (para 0013). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the nonwoven flat sheets of Shi et al. as the separator for a battery, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

As to claim 6, Yamashita et al. teaches different binders. Examples include PVDF (as used in previously cited example 6) and acrylonitrile-butadiene (copolymer latex) (col. 7, lines 59-65).

As to claim 8, Yamashita et al. teaches that Figs. 7(a) to (c) show with all of the structural attributes of their battery and can additionally be spirally wound to form a spirally wound unit cell (col. 16, lines 41-48).

6. Claims 1, 2, 4, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5869208 (Miyasaka) in view of US 2001/0004502 (Nakamizo et al.) and Shi.

As to claim 1, Miyasaka teaches of a lithium ion secondary battery (col. 1, lines3-7). Miyasaka's positive electrode material is a lithium metal oxide (col. 2, lines 37-44, specific examples seen in col. 11, lines 44-52). Furthermore, the negative electrode is capable of receiving (absorbing) and releasing (desorbing) lithium ion/metal (col. 6, lines

54-58). There is a separator [10] which separates the positive electrode [8] and negative electrode [9] (col. 7, lines 54-65; fig.). Miyasaka exemplifies two types of separator material a sheet and a non-woven sheet (fabric) (col. 9, lines 62-67). Furthermore it is noted that there is a protective layer (porous film) formed on the surface of the positive electrode (col. 6, lines 59-64). First it is noted that the protective layer has small openings/voids, showing that is it porous (col. 7, lines 29-31). Specifically, it is taught that the protective layer is formed on the surface of the positive using a binder (the use of a binder constitutes an adherence) (col. 7, lines 18-21, lines 32-36; col. 12, line 58 to col. 13, line 6). Furthermore, the protective layer (porous film) is a mixture of particles of electro-insulative material (filler) with a binder (col. 7, lines 18-21). Alumina is within a list of electro-insualtive materials, and is specifically used (in combination with titanium dioxide) in the example (col. 7, lines 1-10; col. 12, lines 58-63). It is taught that the electro-insulative (filler) is most preferably in the protective layer is 90-98% by weight (a portion that is completely within the claimed range) (col. 7, lines 26-29). In the specified example of the protective, the filler material is a mixture of alumina and titanium oxide, wherein the only solid portion other than this such material is the use of CMC (0.5 wt %) and PVDF (2 wt %) (col. 12, line 58 to col. 13, line 2). Accordingly such a mixture would yield that the filler (alumina and titanium dioxide) material is in a weight percent of 97.5% (100%-0.5%-2%).

It is noted (a) that although Miyasaka exemplifies a non-woven sheet for a separator (col. 9, lines 64-67), such a material is not specifically used in an example, (b) that Miyasaka does not specifically mention the melt-down temperature of the

separator, (c) the exact the thicknesses of each individual section of the separator: 3 μm to 10 μm for the porous film layer (protective layer Miyasaka) and 15 μm to 25 μm for the non-woven fabric (rendered obvious to be separator of Miyasaka, set forth below with respect to section (a)) wherein the total thickness is 18 μm to 30 μm.

With respect to (a), it is first emphasized Miyasaka's teaching at the very least renders obvious the replacement of a non-woven, as it only exemplifies two types of separators, one of which is non-woven (col. 9, lines 62-67). Accordingly, although the separator used for the example is a polypropylene film (and not an explicit non-woven material) (col. 12, lines 29-31), Miyasaka's teaching at the very least renders obvious the replacement of a non-woven, as it only exemplifies two types of separators, one of which is non-woven. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416. Furthermore, since Miyasaka recognizes the use of both a sheet and a non-woven, at the very least, the substitution of the non-woven for the film in the example would have yielded the predictable result of acting as a separator material within the battery system. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to substitute a film separator for a non-woven separator, as Miyasaka specifically appreciates both types of separators, and wherein the substitution of one known, appreciated type (i.e. non-woven) for another known, appreciated type (i.e. film/sheet) would have yielded the predicable result of operating in the same manner.

Additionally, at this point Nakamizo et al. is also relied upon to give motivation, as to why one of ordinary skill in the art would have found to obvious to replace a polypropylene film with a non-woven of the same material. Nakamizo et al. teach that it is known to use microporous films, such as polypropylene, however, such films do not retain electrolyte well, which leads to an increase in internal resistance (para 0007). However, non-woven fabric separators (of, for example polypropylene) improve electrolyte-retaining nature (para 0008). Accordingly, the motivation to use a non-woven instead of a film electrolyte would be to improve electrolyte retention, which would in turn reduce internal resistance (para 0007-0008). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use a non-woven separator instead of a film separator (both embodied by Miyasaka), as taught by Nakamizo et al. in order to improve electrolyte retention and reduce internal resistance.

With respect to (b), Shi et al. teaches a high melt integrity battery separator for lithium ion batteries (title). It is specifically Shi mentions that a non-woven separator comprising polypropylene is known to have a dimensional stability up to 167°C (para 0007, lines 8-11). Furthermore, Shi specifically notes that higher melt integrity is desired in order to not inhibit ion flow between the cathode and anode and in order to maintain dimensional stability (para 0008; para 0011). Therefore, Shi et al. provides motivation for wanting to make the separator have as high of a melt integrity (temperature) as possible (wherein at least 200°C is desired), which includes sustaining dimensional stability and strength and for promoting ion transfer (since ion transfer

would be stopped if the melt integrity was too low, thus inhibiting the battery from operating) (para 0008; para 0011). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to impart as high of a melt integrity to the separator (167°C, 200°C, and 380°C specifically noted) as possible in order to improve dimensional stability of the separator at higher temperatures and in order to keep the ions flowing (to facilitate battery operation).

With respect to (c), it is noted that Miyasaka at the very least renders obvious the claimed ranges of the porous film thickness, non-woven fabric thickness, and the total thickness. First it is noted that the protective layer (porous film) has a preferable, exemplified range of between 2-10 μm (col. 7, lines 40-41). It is noted that most of this specifically appreciated range is coincident with the claimed range (of 3-10 μm). Furthermore, Miyasaka embodies the thickness of the separator (embodied to be a sheet or a non-woven sheet), which is most preferably in a range of 5-30 μm (col. 9, lines 62-65; col. 10, lines 1-3). It is noted that this specifically appreciated range overlaps the claimed range (of 15-25 μm). Accordingly, a total thickness with respect to the individual thicknesses appreciated would be 7-40 μm, which also overlaps the claimed range. As Miyasaka embodies overlapping ranges for the porous film thickness, non-woven fabric thickness, and total thickness, it would at least render obvious the claimed range in such an overlapping manner. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778

F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

As to claim 4, Miyasaka embodies three specific separator materials, one of which is polypropylene (col. 9, lines 62-66). It is noted that polypropylene material is specifically embodied within the example (col. 12, lines 29-31). Accordingly, Miyasaka at the very least render obvious the use of polypropylene as the material for the separator. (It is reiterated that as set forth in claim 1, part (a), it would have been obvious to substitute the type of separator – i.e. non-woven for the film – within the given example. Accordingly, the combination as made and applied to the specific example above would yield a non-woven polypropylene separator, further rendering obvious the material.)

As to claim 8, Miyasaka teaches of a wound battery, wherein there is a positive electrode [8] negative electrode [0] and a separator [10] separating them (fig.; col. 7, lines 54-65).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka in view of Shi as applied to claim 1 above, and further in view of US 2002/0037450 (Suzuki et al.).

Miyasaka teaches binder materials for the protective layer. Such binder materials are the same as the ones used for the positive electrode materials, wherein

carboxymethyl cellulose (CMC) is specifically appreciated (col. 7, lines 18-25). It is specifically noted more materials (wherein CMC is included) are exemplified in col. 8, lines 33-40). Miyasaka does not specifically teach of a binder having an acrylonitrile group.

However, Suzuki et al. specifically teach of a binder material used in the positive electrode of a lithium battery (para 0024). Specifically, the binder used is a combination of 2-ethylhexylacrylate, acrylic acid, and acrylonitirle (para 0031). The motivation for using such a binder is in order to have a binder that does not require heating to work and contains no water, in order to have a binder that is flexible but still maintains its form, and in order to provide a binder with the correct amount of stickiness and elasticity in order to prevent binder deterioration as well as to ensure strength (para 0031-0033). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use the binder taught by Suzuki et al. (containing acrylonitrile) as the binder in the protective layer of Miyasaka (instead of CMC), in order to provide a binder that would be simple to use (as it does not require heat and does not have extraneous water) and in order to impart a better binder with the right amount of stickiness and elasticity (which ensures that the binder is not deteriorated and ensures proper imparting of strength to the layer). (It is again noted that Miyasaka teaches that the binder used in the protective layer is the same as that used in a positive electrode, and thus such a teaching is combinable.)

Response to Arguments

8. Applicant's arguments filed February 4, 2010 have been fully considered but they are not persuasive.

Applicant argues that the previous rejection (with respect to Yamashita et al.) that although a total thickness (25 μm) is taught, the thicknesses of the individual layers (0.5-20 μm for the porous film and 15-50 μm, as previously claimed).

Examiner respectfully disagrees with Applicant's position. First it is noted that such a similar rejection has been made and has been upheld by the Board. It is also noted that such ranges are no longer claimed, and thus such an argument is moot. The fact that the originally claimed ranges encompassed such wide ranges that the total thickness given would obviate the individual thicknesses due to the wide ranges of the individual thicknesses was a factor in the previously applied rejection. Furthermore, it is submitted that although the each individual layer of the separator has not been individually set forth, Yamashita et al. at the very least that separator thickness is a result effective variable, wherein if it is too thin, it will be mechanically weak, but if it is too thick, there will not be enough active material for electrochemical reaction (col. 12, lines 22-42). Accordingly, Examiner at least submits that the separator thickness (and accordingly thickness of each layer) is a result effective variable. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the thickness of the separator (and thus each layer of the separator), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It has been held that discovering that general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,*105 USPQ 233. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art *unless* there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). However, again, it is submitted that such broad ranges are no longer claimed, thus such arguments are not applicable and are moot. (See below for a response with respect to how Yamashita et al. still renders obvious the newly claimed ranges.)

Applicant states that Miyasaka fails to specifically teach or suggest the use of a non-woven fabric in the separator.

Examiner respectfully disagrees with such a statement. Although a non-woven fabric is not used in the particular example (not specifically taught in such an example), it is submitted that Miyasaka does at the very least suggest the use of a non-woven separator. Specifically, it is noted that Miyasaka sates: "For instance, a sheet or **non-woven** sheet made of an olefinic polymer such a polypropylene and polyethylene, or glass fiber can be employed [as the separator]" (emphasis added) (col. 9, line 64-66). Examiner is unsure how Miyasaka fails to at the very least suggest the use of a non-woven fabric and invites Applicant to further explain their position. (Furthermore, it is noted that Nakamizo et al. further shows why one of ordinary skill in the art would have

wanted to use a non-woven fabric embodiment of a separator.) Accordingly, it is submitted that the use of a non-woven fabric has been rendered obvious.

Applicant argues that Yamashita does not teach or suggest the thickness of the individual layers ([13A] and [13B] as applied to the rejection) but does recognize that the drawings suggest that the two layers suggest the layers [13A] and [13B] are equal and thus could render obvious the claimed ranges for the individual thicknesses (15-25 μm for the non-woven fabric and 3-10 μm for the heat resistant layer).

Examiner respectfully disagrees. In response to the amended ranges, it is submitted that the drawings (fig. 5) have been relied upon to provide the suggestion of the thicknesses of the individual layers [13A] and [13B] to be equal (as Applicant admits is the suggestion). As set forth in the rejection, example 6 was relied upon, wherein the total thickness is 25 μm. This would yield each individual layer having a thickness of 12.5 μm, wherein 12.5 μm is seen to be close to the upper limit of the porous film thickness (10 μm as claimed) as well as the lower limit of the non-woven fabric thickness (15 μm as claimed). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Additionally, claims that differ from the prior art only by slightly different (non-overlapping) ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. (In re Woodruff, 16 USPQ2d 1935,1937 (Fed. Cir. 1990)). It is emphasized that random picking and

choosing by Applicant (within larger ranges appreciated by Applicant) lack importance with respect to the larger ranges appreciated by Applicant barring a clear showing of unexpected results. See MPEP §716.02. Accordingly, as Applicant has not shown or provided any proof or criticality (of 10 μm upper limit of the porous film thickness and of he 15 μm lower limit to the non-woven fabric thickness), and 12.5 μm is close to both of these values, the individual thicknesses are still seen to be obvious. Accordingly, such an argument is not found to be persuasive, and the rejection of record is maintained.

Applicant argues that their claimed ranges (of the individual layers) provides a high design capacity (1900 mAh), safety, and retention rate, wherein comparative example 1 (only including a non-woven fabric) is insufficient.

First, Examiner would like to interpret Applicant's statement as an attempt to establish criticality. However, Examiner submits that no criticality has been established. The claimed range will be compared to (a) the rejection using Yamashita et al. as a primary reference, (b) the rejection using Miyasaka as a primary reference, (c) examples in the disclosure that fall outside of the claimed range, and (d) comparative example 1.

With respect to (a), it is submitted that such a rejection renders obvious the use of a non-woven fabric and a porous film (as upheld by the BPAI). Additionally, the example relied upon (in conjunction with the suggestion of individual thicknesses) renders obvious each individual layers having a 12.5 μm thickness. Applicant has not shown or provided any proof or criticality (of 10 μm upper limit of the porous film thickness and of he 15 μm lower limit to the non-woven fabric thickness), and 12.5 μm is close to both of

these values, the individual thicknesses are still seen to be obvious. (And thus the characteristics provided by such a structure would be expected to follow (i.e. the same as the claimed invention).) Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

With respect to (b), the rejection renders obvious overlapping ranges to the claimed thicknesses. It is noted that the protective layer (porous film) has a preferable, exemplified range of between 2-10 μm (col. 7, lines 40-41 of Miyasaka). Miyasaka embodies the thickness of the separator (embodied to be a sheet or a non-woven sheet), which is most preferably in a range of 5-30 μm (col. 9, lines 62-65; col. 10, lines 1-3). As the specifically appreciated ranges overlap the claimed ranges, it is unsure how it would not render obvious the claimed ranges. Applicant has not shown or provided any proof or criticality to the claimed ranges (over that appreciated by Miyasaka). (And thus the characteristics provided by such a structure would be expected to follow (i.e. the same as the claimed invention).) Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

With respect to (c), it is submitted that Applicant's statement with respect to such characteristics are incorrect (as compared with disclosure). For example, example 6 meets the claimed thickness ranges but fails to meet the design capacity (table 1). However, the other characteristics (for example capacity retention, nail penetration, defective rate) appear to be comparable to that of example 1, which has thicknesses within the claimed range. Furthermore, example 4 falls outside of the claimed thickness ranges but meets the design capacity (table 1). Similarly, the characteristics (for

example capacity retention, nail penetration, defective rate) appear to be comparable to that of example 1, which has thicknesses within the claimed range. Accordingly, it is uncertain what is unexpected by the specified design capacity. Furthermore, as set forth above, there appears to be no criticality of the ranges claimed, as both examples 4 and 6 fall outside of the claimed range but still have comparable characteristics to those examples which fall within the claimed range (for non-limiting example, example 1). Lastly, it is set forth that the provided examples do not show true criticality. To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. *In re Hill*, 284 F.2d 955, 128 USPQ 197 (CCPA 1960). See MPEP §716.02(d). However, it is noted that the endpoint of the claimed thickness of the porous film (3 μm) is not even shown in any example. It is unsure how criticality of a range can be established if the entire range itself is not shown. Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

With respect to (d), it is submitted that Applicant's comparison with comparative example 1 is not found to be convincing, as comparative example 1 is not being relied upon in the rejection. Accordingly, such a comparison is insufficient to rebut obviousness as set forth by the rejection. Additionally, such a comparison mischaracterizes the prior art rejection. None of the primary references in the prior art references have only one non-woven layer. In both Yamashita et al. and Miyasaka, a two layer structure is used (wherein one porous layer is there and a non-woven layer is obvious). Accordingly, it is submitted that the comparison of the claimed ranges with

respect to comparative example 1 is insufficient to show any criticality with respect to the rejection of record, as the prior art of record is closer prior art than comparative example 1. Note: Comparisons must be made with respect to the closest prior art. See MEPE §716.02(e). Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that Miyasaka does not specifically disclose a non-woven fabric with a thickness of 5 to 30 μm.

Examiner respectfully disagrees. It is submitted that Miyasaka describes the separator, embodies the use of a non-woven sheet and then states that the separator has a thickness of "preferably 5 to 30 μm" (col. 9, line 62 to col. 10, lines 1-3). It is unsure how this disclosure is not found in Miyasaka (and how this would not suggest/render obvious a non-woven fabric of the stated thickness, even if not specifically used in the example). (Furthermore, it is noted that Nakamizo et al. further shows why one of ordinary skill in the art would have wanted to use a non-woven fabric embodiment of a separator.) Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

With respect to the arguments regarding the 103 rejections, Applicant argues that the prior art used to obviate the rejected claims (Shi, Fujiwara, Nakamizo) do not cure the deficiencies of the primary references (Yamashita and Miyasaka). Applicant does not argue how the combination is not proper. Therefore, the Examiner maintains the obviousness rejections and upholds the rejection of the primary reference, as above. (It is noted that it is unsure how Nakamizo et al. does not cure any deficiencies. It is relied

upon in conjunction with Miyasaka to further shows why one of ordinary skill in the art would have wanted to use a non-woven fabric embodiment of a separator (wherein Miyasaka embodied both a non-woven sheet and a sheet), where Applicant's arguments towards Miyasaka appear to be directed to having non-woven fabric.)

Accordingly, it is submitted that all of the claim limitations have been rendered obvious by the rejection set forth above (contrary to what Applicant is alleging).

Applicant argues that the dependent claims are distinct from the prior art of record for the same reason as the independent claim.

Examiner respectfully disagrees. The rejection with respect to the independent claim has been maintained, and thus the rejections to the dependent claims are maintained as well.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./
Examiner, Art Unit 1795

/Gregg Cantelmo/
Primary Examiner, Art Unit 1795